Technology: Optoelectronics

LED intensity & power

Pro-Lite Technology LLP (Milton Keynes, UK) has a range of modular radiometers and photometers designed specifically for the determination of LED luminous and radiant intensity and power. Measurements are made using photodiode detectors with either radiometric filter ('flat response,' 450-950nm) or with a photopic filter precision matched to CIE V (l) response. An integrating sphere probe ensures that all of the highly divergent light from the LED is captured, which minimises positional errors associated with using large area photodiodes to measure LED power. For luminous and radiant intensity measurements, the LED is fixed using a measurement probe with a defined solid angle field of view into the photodiode.

Thorlabs gets Tektronix GmbH

Thorlabs Inc has acquired Tektronix Munich GmbH, a subsidiary of Tektronix Inc. Formerly Profile Optische Systeme GmbH, Tektronix Munich has a high performance product reputation. PMD analytical instruments, DWDM sources, control modules, and laser diode instrumentation are representative of its portfolio.

New low power laser

Coherent Inc has a new low-power CO_2 laser with excellent beam quality and very small footprint. The GEM-40 OEM laser provides more than 40W of output power at 10.55-10.63µm, with greater than 98% TEM OO spatial mode, and M2 up to 1.2 beam quality. The GEM-40 is ideal for medium/high-volume engraving and desktop manufacture.

E-lux excimer beam light

TuiLaser of Germany has introduced a compact excimer-lamp that uses an electron beam, rather than a gas discharge, to stimulate light emission. The e-lux is fully tunable from continuous wave (CW) right down to pulses as short as a few nanoseconds. In contrast to other excimer sources, the e-lux is electrode-free and does not rely on a gas discharge. It uses an electron-beam that is separated from the gas by a thin film. The electrons react with the gas over a small area, giving control over the final emitted beam size. Lamps can have an efficiency approaching 40%. The company has two prototypes. The first has an output of 308µ and the second emits at 121µ. The same technique can be used to generate light at the full range of excimer wavelengths including 157, 193 and 248µ. TuiLaser hopes to be selling the product by year-end.

FDA clearance for Alderm, PhotoTherapeutic & Lumenis

An acne treatment system that uses blue LEDs is to go on sale in the US. Alderm of the US and Photo Therapeutics of the UK have received clearance from the US Food and Drug Admin. to market their system. The Omnilux Blue system will now be available in the US and used for treating a range of skin conditions including moderate inflammatory acne. The instrument contains five arrays of LEDs emitting at 415µ and delivers approximately 40mW/cm² to the surface of the skin. Patients do not have to apply a cream to their skin as the technique simply relies on the interaction of the blue light with the infected skin. Lumenis Inc also has FDA clearance for its Intense Pulsed Light technology products for treatment of hype-pigmentation and redness associated with the skin condition rosacea.

"Our ongoing IPL technology investment continues to set the pace with expanded applications," says executive VP, Alon Maor. Lumenis has annual investments in R&D that far exceed the industry average. It is also one of the most diversified manufacturers with gas-based, solid-state and diode-pumped lasers.

Other applications include VersaPulse PowerSuite holmium and holmium neodymium:YAG (Nd:YAG) laser for surgical treatment of kidney stones and benign prostatic hyperplasia.

Escaping diffraction

An international team of physicists led by Henri Lezec and Thomas Ebbesen of the Louis Pasteur University in Strasbourg has shown that large amounts of light can pass through a sub-wavelength aperture in a patterned metal film without being diffracted. Lezec and co-workers created a sub-wavelength aperture in a thin silver film and etched a periodic pattern of grooves around it, using a focused ion beam. By patterning the reverse side of the film, they also discovered that the light emerges from the hole as a tightly focused beam that can propagate with very little divergence. The team then found that the direction of the transmitted light could be controlled by changing the symmetry of the periodic pattern. The technique may be useful in a variety of nanoelectronics applications, including optimising near-field devices for micro scopy or data storage, and improving optical devices such as light-emitting diodes (LEDs) and semiconductor lasers.

Nano nitrides emerging

Source for micro nano belts, combs, mills and saws

Korean researchers are working on large scale synthesis of gallium nitride nanosaws using CVD. A large quantity of GaN nanostructures (nanosaws) was produced by a CVD of $Ga/Ga_2O_3/B2O_3$ mixture under NH_3 flow. All of them have a single-edged sawlike configuration. The average width of the nanosaw is in the range 100 nm–1m and the thickness is about 1/10 of the average width. They consist of a single-crystalline wurtzite structure with the [0 1 1] direction parallel to the long axis and the [0 0 1] direction perpendicular to the edge of saw teeth. Jagged edges are in an angle of 100°–110°. The room-temperature cathodoluminescence exhibits a strong band-edge emission at 3.46eV. The idea is catching on. At a US surface science symposium in June, a poster prepared by D Moore, *et al* was devoted to 'Nanobelts, nanocombs, nanowindmills and nanosaws of wurtzite ZnS.'